

Am



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,585	06/21/2001	Daniel M. Lavery	2207/11237	6346

7590 01/03/2005

SHARMINI N. GREEN
C/O BLAKLELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025

EXAMINER

RAMPURIA, SATISH

ART UNIT	PAPER NUMBER
----------	--------------

2124

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/886,585	LAVERY ET AL.	
	Examiner	Art Unit	
	Satish S. Rampuria	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. This action is in response to the amendment received on Aug 20, 2004.
2. The objection to claim 28 is withdrawn in view of applicant's amendment.
3. Claims 1-30 are pending.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Publication No. 2002/0144083 to Wang et al., hereinafter called Wang, in view of US Patent No. 5,926,819 to Doo et al., hereinafter called Doo.

Per claim 1:

Wang disclose:

- A method for executing a code (page 7, paragraph 88 "executing instructions")
- receiving a trigger instruction (page 3, paragraph 47 "an event triggers the invocation and execution")
- executing an auxiliary code (page 3, paragraph 44, "the instruction is executed" and page 3, paragraph 47 "execution of a pre-computation slice (p-slice code)")

Art Unit: 2124

Wang does not explicitly disclose selecting an entry in a trigger table, the entry associated with the trigger instruction and entry is referenced by the trigger table.

However, Doo, in an analogous computer system discloses selecting an entry in a trigger table (col. 6, lines 30-31 “associating that trigger with the table in the data dictionary”), the entry associated with the trigger instruction and entry is referenced by the trigger table (col. 6, lines 57-58 “a reference to memory for trigger-type specific parameters”).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of selecting the trigger from the table as taught by Doo in the method of executing the code as taught by Wang. The modification would be obvious because of one of ordinary skill in the art would be motivated to select an entry in a trigger table to replicate the trigger instructions as suggested by Doo (col. 2, lines 55-64).

Per claim 2:

The rejection of claim 1 is incorporated, and further, Wang disclose:

- spawning a new thread, the new thread executing instructions included in the auxiliary code (page 5, paragraph 67 “executes a spawn instruction to initiate the speculative thread, and then returns”. Also, see fig. 9)

Per claim 3:

The rejection of claim 2 is incorporated, and further, Wang disclose:

- Executing the new thread concurrently with a parent thread, the parent thread including the trigger instruction (page 5, paragraph 67 “executes a spawn instruction” and page 47,

paragraph 47 “Speculative threads... spawned under... conditions... encountering a basic trigger... occurs when a designated instruction in the main (parent) thread is retired, or... encountering a chaining trigger, when one speculative thread explicitly spawns another speculative thread”)

Per claims 4 and 11:

Wang disclose:

- A method for executing a code (page 7, paragraph 88 “executing instructions”)
- receiving a trigger instruction (page 3, paragraph 47 “an event triggers the invocation and execution”)
- executing a p-slice code (page 3, paragraph 44, “the instruction is executed” and page 3, paragraph 47 “execution of a pre-computation slice (p-slice code)”)

Wang does not explicitly disclose selecting an entry in a trigger table, the entry associated with the trigger instruction and entry is referenced by the trigger table.

However, Doo, in an analogous computer system discloses selecting an entry in a trigger table (col. 6, lines 30-31 “associating that trigger with the table in the data dictionary”), the entry associated with the trigger instruction and entry is referenced by the trigger table (col. 6, lines 57-58 “a reference to memory for trigger-type specific parameters”).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of selecting the trigger from the table as taught by Doo in the method of executing the code as taught by Wang. The modification would

be obvious because of one of ordinary skill in the art would be motivated to select an entry in a trigger table to replicate the trigger instructions as suggested by Doo (col. 2, lines 55-64).

Per claim 5:

The rejection of claim 4 is incorporated, and further, Wang disclose:

- spawning a new thread, the new thread executing instructions included in the auxiliary code (page 5, paragraph 67 “executes a spawn instruction to initiate the speculative thread, and then returns” and page 3, paragraph 47 “execution of a pre-computation slice (p-slice code)”). Also, see fig. 9)

Per claim 6:

The rejection of claim 5 is incorporated, and further, Wang disclose:

- executing the new thread concurrently with a parent thread, the parent thread including the trigger instruction (page 5, paragraph 67 “executes a spawn instruction” and page 47, paragraph 47 “Speculative threads... spawned under... conditions... encountering a basic trigger... occurs when a designated instruction in the main (parent) thread is retired, or... encountering a chaining trigger, when one speculative thread explicitly spawns another speculative thread”)

Per claims 7 and 9:

The rejection of claim 6 is incorporated, and further, Wang disclose:

- storing state information from the parent thread before spawning the new thread (page 4, paragraph 64 “The main thread stores a sequence of values into the live-in buffer before spawning the speculative thread.”)

Per claims 8 and 10:

The rejection of claims 7 and 9 are incorporated, respectively, and further, Wang disclose:

- copying the state information for use in the new thread (page 3, paragraph 48”Copying necessary live-in values into the hardware thread context's register”)

Per claim 12:

The rejection of claim 4 is incorporated, and further, Wang disclose:

- reading an instruction pointer for the p-slice code from the entry in the trigger table (page 6, paragraph 85 “Each entry in the OSC includes a counter, the instruction pointer (IP) of a load of interest, and the address of the first instruction in a pre-computation slice, which identifies which pre-computation slice corresponds to this OSC entry”).

Claim 13 is the computer program product claim corresponding to method claim 1 and rejected under the same rationale set forth in connection with the rejection of claim 1 above.

Claim 14 is the computer program product claim corresponding to method claim 2 and rejected under the same rationale set forth in connection with the rejection of claim 2 above.

Claims 15 and 18, 21 are the system claim corresponding to method claim 1 and rejected under the same rationale set forth in connection with the rejection of claim 1 above.

Art Unit: 2124

Claims 16 and 19 are the system claim corresponding to method claim 2 and rejected under the same rational set forth in connection with the rejection of claim 2 above.

Claims 17 and 20 are the system claim corresponding to method claim 7 and rejected under the same rational set forth in connection with the rejection of claim 7 above.

Per claims 22 and 24:

Wang disclose:

- A method for compiling (page 2, paragraph 33 “each bundle is comprised of three instructions grouped together by the compiler”)
- receiving a function body (page 4, paragraph 55, “Whenever a load (functions or code) is executed”), the function body comprising a trigger instruction (page 4, paragraph 55 “a... number of instructions prior in the... execution... marked as a potential basic trigger”)
- outputting an auxiliary code associated with the function body and the trigger instruction (page 3, paragraph 44, “the instruction is executed” and page 3, paragraph 47 “execution of a pre-computation slice (p-slice code)”)

Wang does not explicitly disclose creating an entry in a trigger table the entry associated with the trigger instruction and the auxiliary code.

However, Doo, in an analogous computer system discloses creating an entry in a trigger table (col. 6, lines 30-31 “associating that trigger with the table in the data dictionary”), the entry associated with the trigger instruction and the auxiliary code (col. 6, lines 57-58 “a reference to memory for trigger-type specific parameters”).

Art Unit: 2124

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of selecting the trigger from the table as taught by Doo in the method of executing the code as taught by Wang. The modification would be obvious because of one of ordinary skill in the art would be motivated to select an entry in a trigger table to replicate the trigger instructions as suggested by Doo (col. 2, lines 55-64).

Per claims 23 and 27:

The rejection of claims 22 and 24 is incorporated, respectively, and further, Wang disclose:

- creating a stub block, the stub block comprising a spawn instruction, the spawn instruction configured to spawn a new thread, the new thread configured to execute the auxiliary code (page 5, paragraph 67 “executes a spawn instruction to initiate the speculative thread, and then returns”. Also, see fig. 9). It is inherent to create the stub block in order to execute the spawn instructions.

Per claim 25:

The rejection of claim 24 is incorporated, respectively, and further, Wang disclose:

- receiving the p-slice code associated with the function body and the trigger instruction (page 3, paragraph 47 “an event triggers the invocation and execution of a pre-computation”).

Per claim 26:

The rejection of claim 24 is incorporated, respectively, and further, Wang disclose:

Art Unit: 2124

- generating the p-slice code (page 4, paragraph 54 “create the pre-computation slice for each load”) associated with the function body and the trigger instruction (page 5, paragraph 76 “process... triggers to basic pre-computation slices”).

Per claim 28:

The rejection of claim 24 is incorporated, respectively, and further, Wang disclose:

- adding store instructions to the stub block, the store instructions configured to store state information of a current thread (page 4, paragraph 63 “Using on-chip memory... because without flash-copy... one thread cannot directly access the registers of another thread”) the state information of the current thread including values contained in live-in registers of the new thread (page 4, paragraph 64 “The main thread stores a sequence of values into the live-in buffer before spawning the speculative thread,”)

Claims 29 and 30 are the computer program product claim corresponding to method claim 24 and rejected under the same rational set forth in connection with the rejection of claim 24 above.

Response to Arguments

4. Applicant’s arguments with respect to claims 1-30 have been considered but they are not persuasive.

In the remarks, the applicant has argued that:

- References Wang and Doo are non-analogous art.
- For claims 1-30 references cannot be combined for such motivation.

Art Unit: 2124

- There is no mention in Doo of any type of auxiliary code.

Examiner's response:

- Both references Wang and Doo are computer related invention and both disclose multithreaded trigger (see abstract). Therefore these references are not non-analogous.
- For claims 1-30, it is noted that the rejection clearly points out where Wang and Doo teach the claimed features and why it would have been obvious to combine their teachings. Specifically, the rejection points out that the motivation to "selecting an entry in a trigger table, the entry associated with the trigger instruction and entry is referenced by the trigger table" would be to provide the replication of data for specific trigger-type data. The combination of Wang and Doo actually do suggest the limitation "selecting an entry in a trigger table" would be same as associating the trigger with the table (see col. 6, lines 30-31) otherwise how one would select an entry without associating it. And "the entry associated with the trigger instruction and entry is referenced by the trigger table" would be same as a reference to memory for trigger type (see, col. 6, lines 57-58) as taught by Doo. Applicant only makes general allegations and does not point out any errors in the rejection. Rather, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Therefore, the rejection is proper and maintained herein.
- For the limitation "auxiliary code", this limitation has been rejected using the reference Wang not Doo. Wang disclose execution of a pre-computation slice which is similar to

auxiliary code as described by the applicant in the specification on page 3, lines 9-13.

Applicant only makes general allegations and does not point out any errors in the rejection.

Therefore, the rejection is proper and maintained herein.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Satish S. Rampuria** whose telephone number is (571) 272-3732. The examiner can normally be reached on 8:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Kakali Chaki** can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2124

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satish S. Rampuria
Patent Examiner
Art Unit 2124
12/27/2004



JOHN CHAVIS
PATENT EXAMINER
ART UNIT 2124